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ULTRA-THIN, CORROSION-
RESISTANT, HYDROGENATED
CARBON OVERCOATS BY
COMBINED SPUTTERING AND
PECVD

ABSTRACT OF THE DISCLOSURE

A method of forming a layer of a hard, abrasion, and corrosion-resistant hydrogenated carbon (C:H) material on a substrate surface comprises steps of:

- (a) providing a vacuum chamber including a carbon sputtering target in the interior space thereof;
- 5 (b) providing a substrate in the chamber interior space, a surface of the substrate the sputtering target;
- (c) supplying the vacuum chamber with at least one hydrocarbon gas and at least one inert gas at separately controllable flow rates and applying
- 10 a sufficient negative potential to the carbon target to generate a plasma in said interior space to deposit a layer of the C:H material on the substrate surface by a process comprising simultaneous sputtering of the carbon sputtering target and plasma enhanced chemical vapor deposition (PECVD) of carbon and hydrogen from the hydrocarbon gas, wherein:
- 15 step (c) includes separately controlling the flow rates of each of the hydrocarbon and inert gases such that the amount of C atoms in the C:H which are contributed by the PECVD component of the process is less than about 50 at. %.

Embodiments of the invention include utilizing the C:H material as a
20 protective overcoat layer for magnetic and magneto-optical recording media.